CSC485: Assignment #3

Due on Wednesday, Dec 6, 2017

Liam Jackson

December 6, 2017

Question 1

a)

stack	buffer	new dependency	transition
ROOT	Nadia, rode, the, old, donkey, with, dexterity		Initial Config
ROOT, Nadia	rode, the, old, donkey, with, dexterity		SHIFT
ROOT, Nadia, rode	the, old, donkey, with, dexterity		SHIFT
ROOT, rode	the, old, donkey, with, dexterity	rode $\overset{nsubj}{\rightarrow}$ Nadia	LEFT-ARC
ROOT, rode, the	old, donkey, with, dexterity		SHIFT
ROOT, rode, the, old	donkey, with, dexterity		SHIFT
ROOT, rode, the, old, donkey	with, dexterity		SHIFT
ROOT, rode, the, donkey	with, dexterity	donkey $\overset{amod}{\rightarrow}$ old	LEFT-ARC
ROOT, rode, donkey	with, dexterity	donkey $\overset{det}{\rightarrow}$ the	LEFT-ARC
ROOT, rode	with, dexterity	rode $\overset{dobj}{\rightarrow}$ donkey	RIGHT-ARC
ROOT, rode, with	dexterity		SHIFT
ROOT, rode, with, dexterity			SHIFT
ROOT, rode, with		with $\overset{pobj}{\rightarrow}$ dexterity	RIGHT-ARC
ROOT, rode		rode $\overset{prep}{\rightarrow}$ with	RIGHT-ARC
ROOT		ROOT $\overset{prep}{\rightarrow}$ rode	RIGHT-ARC

b) A sentence containg n words will be parsed in $2n$ steps. This is due to for every word, it will require one shift step, and an eventual arc step. The ordering of shifts and arcs may vary, but every word requires a shift an arc eventually in its parse.

c) When the parsing mechanism for projective dependency tree specifies transition, we are very clear on what word depends on another. This is because a left arc means the last word on the stack depends on the second last word and a right arc means the second last word on the stack depends on the last word. For a non-projective dependency tree, a word may depend on another word not adjacent to it in the stack, which for our purposes, cannot be done with the parsing algorithm.

Question 2

b) To be frank, my results were not as expected. I've tried various tweaks to the hyperparameters to no luck. Some were slightly better than the default parameters but not up to par with what the assignment expects. I'm evidently making some mistake somewhere in my code, but I cannot locate it, so for this report, I'll just use the base hyperparameters. This yields about 0.56 on LAS and 0.65 on UAS after 10 epochs with final cross entropy of 0.38